National Institute of Environmental Health Sciences

Ambient temperature and morbidity: A review of epidemiological evidence

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Year: 2012
Journal: Environmental Health Perspectives. 120 (1): 19-28

Abstract:

OBJECTIVE: In this paper, we review the epidemiological evidence on the relationship between ambient temperature and morbidity. We assessed the methodological issues in previous studies and proposed future research directions. DATA SOURCES and DATA EXTRACTION: We searched the PubMed database for epidemiological studies on ambient temperature and morbidity of noncommunicable diseases published in refereed English journals before 30 June 2010. Forty relevant studies were identified. Of these, 24 examined the relationship between ambient temperature and morbidity, 15 investigated the short-term effects of heat wave on morbidity, and 1 assessed both temperature and heat wave effects. DATA SYNTHESIS: Descriptive and time-series studies were the two main research designs used to investigate the temperature morbidity relationship. Measurements of temperature exposure and health outcomes used in these studies differed widely. The majority of studies reported a significant relationship between ambient temperature and total or cause-specific morbidities. However, there were some inconsistencies in the direction and magnitude of nonlinear lag effects. The lag effect of hot temperature on morbidity was shorter (several days) compared with that of cold temperature (up to a few weeks). The temperature-morbidity relationship may be confounded or modified by sociodemographic factors and air pollution. CONCLUSIONS: There is a significant short-term effect of ambient temperature on total and cause-specific morbidities. However, further research is needed to determine an appropriate temperature measure, consider a diverse range of morbidities, and to use consistent methodology to make different studies more comparable.

Source: http://dx.doi.org/10.1289/ehp.1003198

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Researcher

Exposure :

weather or climate related pathway by which climate change affects health

Temperature, Other Exposure

Temperature: Extreme Cold, Extreme Heat

Other Exposure: Humidity

Geographic Feature: ☒

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Global or Unspecified

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Injury

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☒

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Other Vulnerable Population: People with pre-existing conditions

Resource Type: ☒

format or standard characteristic of resource

Review

Timescale: ☒

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content